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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/064,886	08/27/2002	Richard Scott Bourgeois	124705	7964

6147 7590 06/04/2004

GENERAL ELECTRIC COMPANY
GLOBAL RESEARCH
PATENT DOCKET RM. BLDG. K1-4A59
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EXAMINER

YUAN, DAH WEI D

ART UNIT PAPER NUMBER

1745

DATE MAILED: 06/04/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.	Applicant(s)	
10/064,886	BOURGEOIS ET AL.	
Examiner	Art Unit	
Dah-Wei D. Yuan	1745	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 May 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-31 is/are pending in the application.
- 4a) Of the above claim(s) 1-11 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 12-17 and 20-23 is/are rejected.
- 7) ☒ Claim(s) 18, 19 and 24-31 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 27 August 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>09032002</u> . | 6) <input type="checkbox"/> Other: _____ |

FUEL CELL STACK AND FUEL CELL MODULE

Examiner: Yuan

S.N. 10/064,886

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June 1, 2004

Election/Restrictions

1. Applicant's election without traverse of Group II, claims 12-31, in Paper filed May 7, 2004 is acknowledged. Claims 1-11 are withdrawn from consideration.

Claim Rejections - 35 USC § 102

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 12-17,20-23 are rejected under 35 U.S.C. 102(e) as being anticipated by Hsu (US 2003/0012997 A1).

With respect to claims 12,17,23, Hsu teaches a fuel cell module comprising a vessel having inlets (228,230) and an outlet (224) and a fuel cell array (35), wherein the fuel cell array typically comprise multiple columns of fuel cell stacks, each stack having electrolyte plates or electrochemical processing plates interleaved with and thermally conducting plates. The reactants processor stacks and fuel cell stacks can be positioned interdigitally in rectangular, hexagon, or octagon pattern to achieve even thermal distribution, i.e., inner and outer volumes are in fluid communication through the fuel cell stacks. Each fuel cell stack comprises at least an

anode, a cathode, an electrolyte plate and an interconnector plate. The electrolyte plates and the interconnector plates are alternately stacked and aligned along their respective apertures. The apertures form axial manifolds that feed the unit cell with the input reactants and exhaust spent fuel. As shown in Figure 5, sealer material (160) can be applied to portions of the interconnector plate at the manifold junctions, thus allowing selectively a particular input reactant to flow across the interconnector surface and across the mating surface of the electrolyte plate. In particular, the sealer materials (160A) is disposed about the input oxidizer manifold (117) whereas the sealer material (160B) is disposed about the fuel input manifolds (118) and the spent fuel manifold (119). Also, the fuel cell array is electrically connected to provide electrical energy. See Paragraphs 45,46, 51,54,55,56,92, Figures 3-6.

With respect to claim 13, the fuel cell module comprises a pressure vessel and planar solid oxide fuel cell units. See Paragraphs 45,95.

With respect to claims 14,15, the inlet is configured to receive the oxidant into either the inner volume or the outer volume of the vessel, whereas the outlet is configured to exhaust the oxidant from either the inner volume or the outer volume of the vessel because the inner volume is in fluid communication with the outer volume in the vessel. See Figure 6.

With respect to claims 16,20, the fuel cell stack comprises interconnector plates (130) having apertures that form axial manifolds. Figures 4 and 5 show the input oxidizer manifold, input fuel manifold and spent fuel manifold. The dimpled surface of the interconnector plate has a substantially corrugated pattern formed on both sides. The corrugated pattern forms the

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reactant flow passageways that channel the input reactants towards the periphery of the interconnector plates. See Paragraphs 51, 52.

With respect to claim 21, the interconnector plate is adjacent to the anode of one of the planar fuel cell units and the cathode of the other planar fuel cell unit. See Figure 5.

With respect to claim 22, each fuel cell stack further comprises a top end plate and a bottom end plate as shown in Figure 6.

Allowable Subject Matter

4. Claims 18,19,24-31 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Claims 18,19 would be allowable because the prior art does not disclose or suggest the fuel cell module further comprising a plurality of corner stack seals, each of the corner stack seals being disposed along an edge or along a face joining two of the fuel cell stacks. Claims 24-31 would be allowable because the prior art does not disclose or suggest the fuel cell module further comprising at least one heat exchanger connecting a pair of the fuel cell stacks and configured to supply the fuel flow exhausted from one of the pair fuel cell stacks to a second pair of fuel cell stacks.

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Conclusion

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Eshraghi (US 6,444,339 B1) teaches microcell structures and assemblies for use in electrochemical generation/conversion of energy.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Dah-Wei D. Yuan whose telephone number is (571) 272-1295. The examiner can normally be reached on Monday-Friday (8:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick J. Ryan, can be reached on (571) 272-1292. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Dah-Wei D. Yuan
June 1, 2004

